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| FORM PTO-1390 (REV. 1-98) | | U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE | | ATTORNEY'S DOCKET NUMBER PS-12626 | |
| TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371 | | | | U.S. APPLICATION NO. (if known, see 37 CFR 1.5) 09/462441 | |
| INTERNATIONAL APPLICATION NO. PCT/EP98/04157 | | INTERNATIONAL FILING DATE July 6, 1998 | | PRIORITY DATE CLAIMED July 8, 1997 | |
| TITLE OF INVENTION DEVICE AND METHOD FOR SEALING LEVELLING DOOR APERTURE OF A COKE OVEN CHAMBER | | | | | |
| APPLICANT(S) FOR DO/EO/US Hans-Josef Giertz, Friedrich-Wilhelm Cyris; Friedrich Huhn, & Franz Liesewitz | | | | | |
| Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information: | | | | | |
| <p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).</p> <p>4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))</p> <p> a. <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</p> <p> b. <input checked="" type="checkbox"/> has been transmitted by the International Bureau.</p> <p> c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</p> <p>6. <input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).</p> <p>7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))</p> <p> a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).</p> <p> b. <input type="checkbox"/> have been transmitted by the International Bureau.</p> <p> c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</p> <p> d. <input checked="" type="checkbox"/> have not been made and will not be made.</p> <p>8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).</p> <p>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</p> <p>10. <input type="checkbox"/> A translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p> <p>Items 11. to 16. below concern document(s) or information included:</p> <p>11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</p> <p>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</p> <p>13. <input checked="" type="checkbox"/> A FIRST preliminary amendment.</p> <p> <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.</p> <p>14. <input type="checkbox"/> A substitute specification.</p> <p>15. <input type="checkbox"/> A change of power of attorney and/or address letter.</p> <p>16. <input checked="" type="checkbox"/> Other items or information:</p> <p> Copy of International Search Report dated November 4, 1998</p> <p> Five (5) sheets of formal drawings</p> <p> Cover sheet of PCT/EP98/04157</p> | | | | | |

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| U.S. APPLICATION NO. (if known, see 37 CFR 1.5) 09/462441 | | INTERNATIONAL APPLICATION NO PCT/EP98/04157 | | ATTORNEY'S DOCKET NUMBER PS-12626 | |
| 17. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1070.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$930.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$790.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$720.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$98.00 ENTER APPROPRIATE BASIC FEE AMOUNT = | | | | CALCULATIONS PTO USE ONLY | |
| | | | | \$ | 840 |
| Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)). | | | | \$ | |
| CLAIMS | NUMBER FILED | NUMBER EXTRA | RATE | \$ | |
| Total claims | 15 - 20 = | 0 | x \$22.00 | \$ | 0 00 |
| Independent claims | 3 - 3 = | 0 | x \$82.00 | \$ | 0 00 |
| MULTIPLE DEPENDENT CLAIM(S) (if applicable) | | | + \$270.00 | \$ | |
| TOTAL OF ABOVE CALCULATIONS = | | | | \$ | 840 00 |
| Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28). | | | | \$ | |
| SUBTOTAL = | | | | \$ | 840 00 |
| Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)). | | | | \$ | |
| TOTAL NATIONAL FEE = | | | | \$ | 840 00 |
| Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property+ | | | | \$ | |
| TOTAL FEES ENCLOSED = | | | | \$ | 840 00 |
| | | | | Amount to be refunded: | \$ |
| | | | | charged: | \$ |

- a. ☒ A check in the amount of \$ 840.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 22-0347. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Vickers, Daniels & Young
 Robert V. Vickers
 50 Public Square
 Suite 2000
 Cleveland, Ohio 44113

SIGNATURE

ROBERT V. VICKERS

NAME

Reg. No. 19,504

REGISTRATION NUMBER

09/462441

430 Rec'd PCT/PTO 06 JAN 2000

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Hans-Josef Giertz, Friedrich-Wilhelm Cyris,
Friedrich Huhn, and Franz Liesewitz

For : DEVICE AND METHOD FOR SEALING
LEVELLING DOOR APERTURE OF A
COKE OVEN CHAMBER

International Application No. : PCT/EP98/04157

International Filing Date : July 6, 1998

Priority Application No. : 197 29 032.9

Priority Filing Date : July 8, 1997

Our Docket : PS-12626

PRELIMINARY AMENDMENT

Asst. Commissioner for Patents
Box PCT
Washington, D.C. 20231

Dear Sir:

Please amend the above referenced application as follows:

In the Abstract:

Please add the abstract, which is attached as page 6 this Preliminary Amendment.

In the Specification:

At page 1, lines 2 and 3, delete "in accordance with the preamble of claims 1 and 15, respectively".

At page 1, line 4, insert the following heading --BACKGROUND OF THE INVENTION--.

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At page 3, line 4, insert the following heading --SUMMARY OF THE INVENTION--.

At page 3, line 11, after the second occurrence of "of" insert --the--; at lines 11 and 12, delete "claims 1 and 9 and, with respect to the method, by claim 15" and substitute therefor --and method described herein--.

At page 3, delete the entirety of line 14; at line 30, delete "in accordance with claim 1".

At page 4, line 14, delete "According to claim 3, the" and substitute therefor --The--.

At page 5, line 21, delete "According to claim 9, a" and substitute therefor --A--.

At page 7, line 17, insert the following heading --BRIEF DESCRIPTION OF THE DRAWINGS--.

At page 7, line 31, insert the following heading --DETAILED DESCRIPTION OF THE INVENTION--.

Delete the entirety of page 10.

At page 11, line 1, delete "Claims" and substitute therefor --Having thus described the invention, it is claimed:--.

In the Claims:

Cancel claims 1-15, and add new claims 16-29 as follows:

16. A device for sealing a leveler door opening of a coke oven chamber during top charging of the coking coal, comprising a housing connectable to the leveler door opening so as to form a seal, said door opening defined by a cross-sectional area of said coke oven chamber, a leveler bar guided into said leveler door opening including at least two side segments and at least one cross segment connecting said two side segments, said housing provided with means for sealing said

cross-sectional area of said leveler door opening, a regulable exhaust fan connected to said housing and flow measuring means at a location within said housing.

17. The device of claim 16, said exhaust fan including an outlet connected to an adjacent coke oven chamber.

18. The device of claim 16, including at least two of said cross segments and at least two sealing plates arranged within said housing to seal said leveler bar from above and below over an area between said two cross segments and including sealing means for sealing said side segments of said leveler bar adjacent said leveler door opening.

19. The device of claim 18, wherein said sealing plates and said sealing strips are provided with press-on means.

20. The device of claim 18, wherein said sealing plates are held in said housing by a partial vacuum, said partial vacuum pressing said sealing plates against said leveler bar.

21. The device of claim 18, wherein said sealing plates are beveled.

22. The device of claim 18, including a plurality of said sealing plates and a plurality of said sealing strips being arranged one behind the other in an axial direction, said axial direction defining a thrust direction for said leveler bar.

23. The device of claim 18, wherein said housing is formed by said sealing plates and said side segments of said leveler bar.

24. A device for sealing a leveler door opening of a coke oven chamber during top charging of the coking coal comprising a housing connectable to the leveler door opening so as to form a seal, said door opening defined by a cross-sectional area of said coke oven chamber, a leveler bar guided into said leveler door opening including at least two side segments and at least one cross
5 segment connecting said two side segments, said housing provided with means for sealing said cross-sectional area of said leveler door opening, and at least one movable sealing element for sealing an inner cross section of said leveler bar between said side segments.

25. The device of claim 24, wherein said movable sealing element is at least one rotary lock.

26. The device of claim 24, wherein said movable sealing element is at least one cell wheel.

27. The device of claim 26, including at least one sealing plate being arranged in said housing.

28. The device of claim 24, wherein said movable sealing element is at least one movable roller.

29. A method for sealing a leveler door opening of a coke oven chamber during the leveling process, including providing a housing and guiding a leveler bar therethrough, forming a seal between said leveler door opening and said leveler bar and exhausting a gas from said housing, the improvement comprising regulating said gas exhaustion by measuring the flow of gas in the area of the leveler door opening and controlling the rate of said gas exhaustion in order that there is no gas flow at the measuring location.

REMARKS

Applicant reiterates and again claims priority on the basis of German application 197 29 032.9 filed on July 8, 1997, and PCT/EP98/04157, filed June 7, 1998. Substantive examination on the basis of this Preliminary Amendment is respectfully requested.

Respectfully submitted,
VICKERS, DANIELS & YOUNG

By: 

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Reg. No. 19,504

(216) 623-0040

[illegible]

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Device and method for sealing a leveler door opening of a
coke oven chamber

The invention relates to a device and method for sealing a leveler door opening of a coke oven chamber in accordance with the preamble of claims 1 and 15, respectively.

5 During the coking of hard coal, the coking coal is typically poured into the coke oven chamber through charging holes in the chamber roof. With this so-called top charging, cones of repose form underneath the charging holes, which must be leveled off by a leveling device to fully utilize the chamber area and leave a free exhaustion space for the charging
10 gases underneath the chamber roof.

15 The leveling apparatus has a leveler bar, which can be inserted into the oven chamber from the outside through a so-called leveler door opening and which is typically mounted on the coke pusher machine, hereinafter referred to as pusher. This pusher can be moved along the coke oven battery from one coke oven chamber to the next so that the ram can push the carbonized coke cake out of the oven chamber toward
20 the opposite coke oven side and the leveling apparatus can subsequently level the coking coal when the coke oven chamber is recharged. Furthermore, the pusher is provided with actuating devices for opening and closing or locking the

coke oven chamber doors located on the machine side and the leveler doors closing the leveler door opening.

5 DE 33 40 067 C2 discloses a sealing device for a leveler door opening provided with a housing that can be connected to the leveler opening to form a seal. A delivery tube branches off from the housing to an adjacent coke oven chamber.

10 DE-AS 11 27 868 discloses a device to prevent the emission of charging gases through the leveler opening, which is provided with a tube enclosing the leveler bar whose length is approximately equal to the distance between two adjacent cross bars of the leveler bar.

15 US Patent 22 68 316 describes sealing sheet metal plates, which seal the gap between the leveler door opening and the leveler bar during the leveling operation.

20 From DE 23 64 458 C3 it is known to connect a housing, through which the leveler bar is guided, to the leveler door opening so as to form a seal. This housing is connected to both a forced draught fan and an exhaust fan. The forced draught fan is used to blow air through nozzles in the direction of the leveler door opening where it is exhausted by the exhaust fan. Suction may be adjusted by means of a re-
25 strictor so as to create an air seal in the housing outside the leveler door opening, which is to prevent gases and flames from exiting through the leveler door opening. In this manner, a closed area is to be created in front of the
30 leveler door opening where pressure builds up corresponding to the pressure in the coke oven chamber so that there is no noticeable pressure difference between the coke oven chamber and the space in front of the leveler door opening. This device basically prevents the emission of charging gases
35 through the leveler door opening. However, a complex apparatus is required. Suction adjustment by means of a restrictor

is relatively inexact such that under certain circumstances air may be blown into the coke oven chamber or charging gases may be sucked out of the coke oven chamber.

5 It is the object of the invention to provide simple devices and methods to ensure a sealed area outside the leveler door opening and thus to prevent the emission of charging gases through the leveler door opening.

10 This object is attained, with respect to the device, by means of the characteristics of independent device claims 1 and 9 and, with respect to the method, by claim 15.

Further developments are described in the subclaims.

15 The invention is based on the idea that the partial vacuum existing in the coke oven chamber during the charging operation with coking coal is also maintained in the area of the leveler door.

20 In an area in front of the opened leveler door opening, or in front of and/or in the leveler door opening, a seal is provided whose sealing function corresponds to a closed leveler door. The area in front of and/or in the leveler door opening may be achieved either by fluidic means, i.e. by creating pressure equality in front of and behind the leveler door opening to create a no-flow zone, or by mechanically sealing the leveler bar.

25 The exhaust fan in accordance with claim 1 is - preferably - adjusted such that there is no longer any flow in the area in front of the leveler door opening. This creates a no-flow zone in the region in front of and/or in the leveler door opening. Flow in this area is measured at a measuring location and the measuring signal is used to regulate or control the exhaust fan.

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The exhaust fan may also be adjusted such as to permit a small amount of ambient air to be sucked into the coke oven chamber. This has only a negligible effect on the exhaustion of the charging gases. In any case, this mode of operation also prevents the emission of charging gas through the leveler door opening.

It is also possible to connect the outlet of the exhaust fan with an adjacent coke oven chamber. This mode of operation uses the partial vacuum of the adjacent coke oven chamber. In this case, suction is operated in such a way that charging gases are sucked into the adjacent oven.

According to claim 3, the space in front of the leveler door opening is mechanically sealed to prevent the emission of charging gases. The leveler bar is sealed by sealing plates above and below. Along the sides, the leveler bar is sealed by sealing strips. Together with the cross segments this external leveler bar seal forms a closed hollow box since the sealing plates seal at least the area of two cross segments.

The sealing plates may be positioned in such a way that they are supported against the side segments, the cross segments or the side and cross segments of the leveler bar. However, pressure means, such as springs, may also be used to press them against the side segments of the leveler bar. The seal may also be reinforced by the sealing strips that are pressed against the side segments of the leveler bar, for example by means of springs.

The sealing plates may also be arranged in the housing in such a way that a partial vacuum within the leveler bar presses them against the leveler bar, which again increases the sealing effect.

Along their edges, the sealing plates may be rounded and/or beveled. This prevents the leveler bar from knocking against the edges of the sealing plates during the leveling process. The sealing plate may also be divided into several segments. This improves the seal provided by the sealing plate if the leveler bar is uneven or has a variable cross section

It is also possible to dispose a plurality of sealing plates and sealing strips within the housing one behind the other. This again increases the sealing effect.

To improve their durability, the sealing plates may be equipped with wear protection. When sealing plates are used, the housing may be eliminated since a housing is formed by the sealing plates and the side segments of the leveler bar.

The coal spillage collector may be disposed anywhere outside the area of the sealing plates.

According to claim 9, a seal of the inside cross section of the leveler bar is provided between the side segments. These sealing elements must be made flexible so that they can avoid the cross segments of the leveler bar. The area between the side segments of the leveler bar and the housing is sealed by one or more sealing strips arranged one behind the other.

The simplest solution is to arrange rotary locks in the housing. The rotary locks may be arranged hanging inside the housing, for example in a one-piece flap design. They seal off the cross section between the side segments of the leveler bar. If the leveler bar moves, the leveler bar cross segments press against the rotary lock upon approach and contact. The rotary lock is pushed aside and conforms to the upper edge of the leveler bar cross segment to form a seal.

If the leveler bar continues to move, the rotary lock swings back into the space between the side segments and seals it until the next cross segment is reached.

5 A further possibility would be to seal the inside cross section of the leveler bar by means of cell wheels. Cell wheels are arranged in a cell wheel housing above and/or below the leveler bar such that the cell wheel vanes overlappingly engage between the leveler bar side segments. If
10 the leveler bar moves, the cross segments cause the cell wheels to rotate.

The lower cell wheel housing can be equipped with an excess coal discharge unit.

15 The cell wheel may also be dimensioned in such a way that the cell wheel vanes, similarly to the rotary locks, seal the entire cross section between the leveler bar side segments. In this case a sealing plate is disposed in the lower
20 portion of the housing opposite the cell wheel. This sealing plate seals at least the area of two leveler bar cross segments and may also be formed by the bottom plate of a housing enclosing the leveler bar.

25 A further possibility of an inner leveler bar seal is to install movable rollers in a roller housing. The rollers are dimensioned in such a way that they take up and seal the entire cross section between the leveler bar side segments. The rollers may move up and down within the roller housing
30 and thus avoid the cross segments of the leveler bar.

Of course, a plurality of seals may be arranged within the housing. It is also possible to combine the exhaust fan with the seal by sealing plates and/or movable sealing elements.

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The housing may also be made large enough so that the leveler door may be opened and locked within the housing.

5 The aforementioned components as well as the components claimed and described in the exemplary embodiments to be used according to the invention are not subject to any restrictions with respect to their size, form, material selection and technical design so that the selection criteria known in the respective area of application may be used
10 without reservation.

Additional details, features and advantages of the subject of the invention will become evident from the following description of the associated drawing, which depicts preferred embodiments of the device for a leveler door opening by way of example. The drawing shows the following:

15 Figure 1 is a perspective view of an embodiment of the sealing device with exhaust fan;

20 Figure 2 is a second embodiment with sealing plates and sealing strips;

25 Figure 3 is a third embodiment with rotary locks;

Figure 4 is a fourth embodiment with a cell wheel and a sealing plate;

30 Figure 5 is a fifth embodiment combining a plurality of sealing plates with an exhaust fan.

35 Figure 1 shows a housing 1 open at its two opposite ends in which a leveler bar 2 open at the top and at the bottom and provided with side segments 3 and cross segments 4 may be inserted and retracted. Housing 1 fits against the circumference of a leveler door opening 5 of a coke oven chamber 6

with a ascension pipe 7 so as to form a seal. Above housing 1 is an exhaust fan 8 with a suction pipe 15 that is connected to housing 1. A regulating or control unit (not shown) adjusts the exhaust fan so that there is essentially no gas flow in housing 1 near leveler door opening 5 of coke oven chamber 6. Instead, a no-flow zone 9 is formed in an area located between the interior of coke oven chamber 6 and the end of housing 1 or suction pipe 15 that is remote from leveler door opening 5. The charging gases are exhausted through ascension pipe 7 while ambient air is exhausted through exhaust fan 8 so that it does not reach the coke oven chamber. Any flow is sensed at a measuring location 10.

Figure 2 shows that sealing plates 11 and 12 are arranged inside housing 1 above and below leveler bar 2, which is open at the top and the bottom. Sealing plates 11 and 12 fit against the upper and lower edges of side segments 3 and cross segments 4 of leveler bar 2 and protrude from housing 1 at the housing end that is remote from coke oven chamber 6. Sealing plates 11 and 12 are made longer than the distance between two cross segments 4 serving as leveler segments. As a result, leveler door opening 5 is always sealed toward the outside during the leveling operation by at least one cross segment 4 of leveler bar 2. Side segments 3 of leveler bar 2 are also sealed by sealing strips 13 and 14.

Figure 3 illustrates sealing by means of rotary locks. Two rotary locks 20 and 21 capable of rotating around rotary axes 22 and 23 are shown inside housing 1. The other reference numbers have the same meaning as those in the preceding figures. Rotary locks 20 and 21 seal the inner cross section between side segments 3 of leveler bar 2 as well as the cross sectional housing areas above and below that. Sealing strips 13, 14 and 24, 25 seal the side segments 3 of the leveler bar 2 toward the outside. When leveler bar 2 moves into coke oven chamber 6, cross segments 4 knock

against rotary locks 21 and 22. The rotary locks avoid cross segments 4 by a rotational movement, respectively, and reseal the area between side segments 3 of leveler bar 2 after they move back into position.

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Figure 4 shows a four-vane cell wheel 40 in a cell wheel housing 41 whose cell wheel vanes 42 cover the entire cross section between side segments 3 of leveler bar 2. Below leveler bar 2, there is a sealing plate 43, which fits against the lower edges of side segments 3 to form a seal. As leveler bar 2 is inserted or retracted, cell wheel 40 is respectively rotated by another 90 whenever a cross segment 4 passes under the cell wheel axle.

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Figure 5 depicts a combination of different sealing options. Figure 5 shows that leveler bar 2 is sealed with additional sealing plates 50 and 51 located above and below, respectively. Furthermore, an exhaust fan 8 is connected to housing 1 via suction pipe 15. The other reference numbers have the same meaning as those in the preceding figures. A coal spillage collector 52 is disposed below housing 1.

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List of Reference Numbers

| | |
|----|------------------------------------|
| 1 | housing |
| 2 | leveler bar |
| 3 | side segments |
| 4 | cross segments (leveling segments) |
| 5 | leveler door opening |
| 6 | coke oven chamber |
| 7 | ascension pipe |
| 8 | exhaust fan |
| 9 | no-flow zone |
| 10 | measuring location |
| 11 | sealing plate |
| 12 | sealing plate |
| 13 | sealing strip |
| 14 | sealing strip |
| 15 | suction pipe |
| 20 | rotary lock |
| 21 | rotary lock |
| 22 | rotary axis |
| 23 | rotary axis |
| 24 | sealing strip |
| 25 | sealing strip |
| 40 | cell wheel |
| 41 | cell wheel housing |
| 42 | cell wheel vane |
| 43 | sealing plate |
| 44 | sealing strip |
| 50 | sealing plate |
| 51 | sealing plate |
| 52 | coal spillage collector |

Claims

1. Device for sealing a leveler door opening of a coke oven chamber during top charging of the coking coal provided with a housing connectable to the leveler door opening so as to form a seal, through which is guided leveler bar (2) comprising at least side segments (3) and cross segments (4) connecting the latter, which housing is provided with means for sealing the cross sectional area of the opened leveler door or in front of the opened leveler door, **characterized in that** a regulable or controllable exhaust fan (8) is connected to housing (1) and a measuring location (10) is provided for flow measurement.
2. Device according to claim 1, characterized in that the outlet of exhaust fan (8) is connected to an adjacent coke oven chamber.
3. Device according to claim 1 or 2, characterized in that sealing plates (11, 12) are arranged in housing (1) to seal leveler bar (2) from above and below at least over the area of two cross segments (4) and sealing strips (13, 14) are arranged to seal side segments (3) of leveler bar (2).
4. Device according to claim 3, characterized in that sealing plates (11, 12) and sealing strips (13, 14) are provided with press-on means.
5. Device according to claim 3, characterized in that sealing plates (11, 12) are held in housing (1) such that they are pressed against leveler bar (2) by a partial vacuum.

6. Device according to claim 3, characterized in that sealing plates (11, 12) are rounded and/or beveled.
- 5 7. Device according to claim 3, characterized in that a plurality of sealing plates (11, 12, 50, 51) and sealing strips (13, 14, 24, 25) are arranged one behind the other in leveler bar thrust direction.
- 10 8. Device according to claim 3, characterized in that housing (1) is formed by sealing plates (11, 12) and side segments (3) of leveler bar (2).
- 15 9. Device for sealing a leveler door opening of a coke oven chamber during top charging of the coking coal provided with a housing connectable to the leveler door opening so as to form a seal, through which is guided a leveler bar (2) comprising at least side segments (3) and cross segments (4) connecting the latter, which housing is provided with means for sealing the cross sectional area of the opened leveler door or in front of the opened leveler door, characterized in that movable sealing elements seal the inner cross section of leveler bar (2) between side segments (3).
- 20 10. Device according to claim 9, characterized in that the movable sealing element is at least one rotary lock (20).
- 25 11. Device according to claim 9, characterized in that the movable sealing element is at least one cell wheel (40).
- 30 12. Device according to claim 11, characterized in that in addition at least one sealing plate (50) is arranged in housing (1).
- 35

13. Device according to claim 9, characterized in that the movable sealing element is at least one movable roller.

5 14. Device according to claims 1 through 13, characterized in that exhaust fan (8) and/or sealing plates (11, 12, 50, 51) and/or movable sealing elements are arranged on the housing.

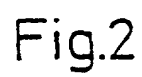
10 15. Method for sealing a leveler door opening of a coke oven chamber during the leveling process, wherein a housing through which the leveler bar is guided is connected to the leveler door opening to form a seal and gas exhaustion is effected in the housing, characterized in that the gas exhaustion is regulated or
15 controlled based on a flow measurement taken in the area of the leveler door opening in such a way that there is essentially no gas flow at that location.

Device for sealing a leveler door opening of a coke oven chamber during top charging of the coking coal provided with a housing connectable to the leveler door opening to form a seal. A leveler bar (2) comprising at least side segments (3) and cross segments (4) connecting the latter is guided through the housing. The housing (1) is provided with means for sealing the cross sectional area of the opened leveler door or in front of the opened leveler door. A regulable or controllable exhaust fan (8) is connected to the housing (1) and a measuring location (10) is provided for flow measurement.

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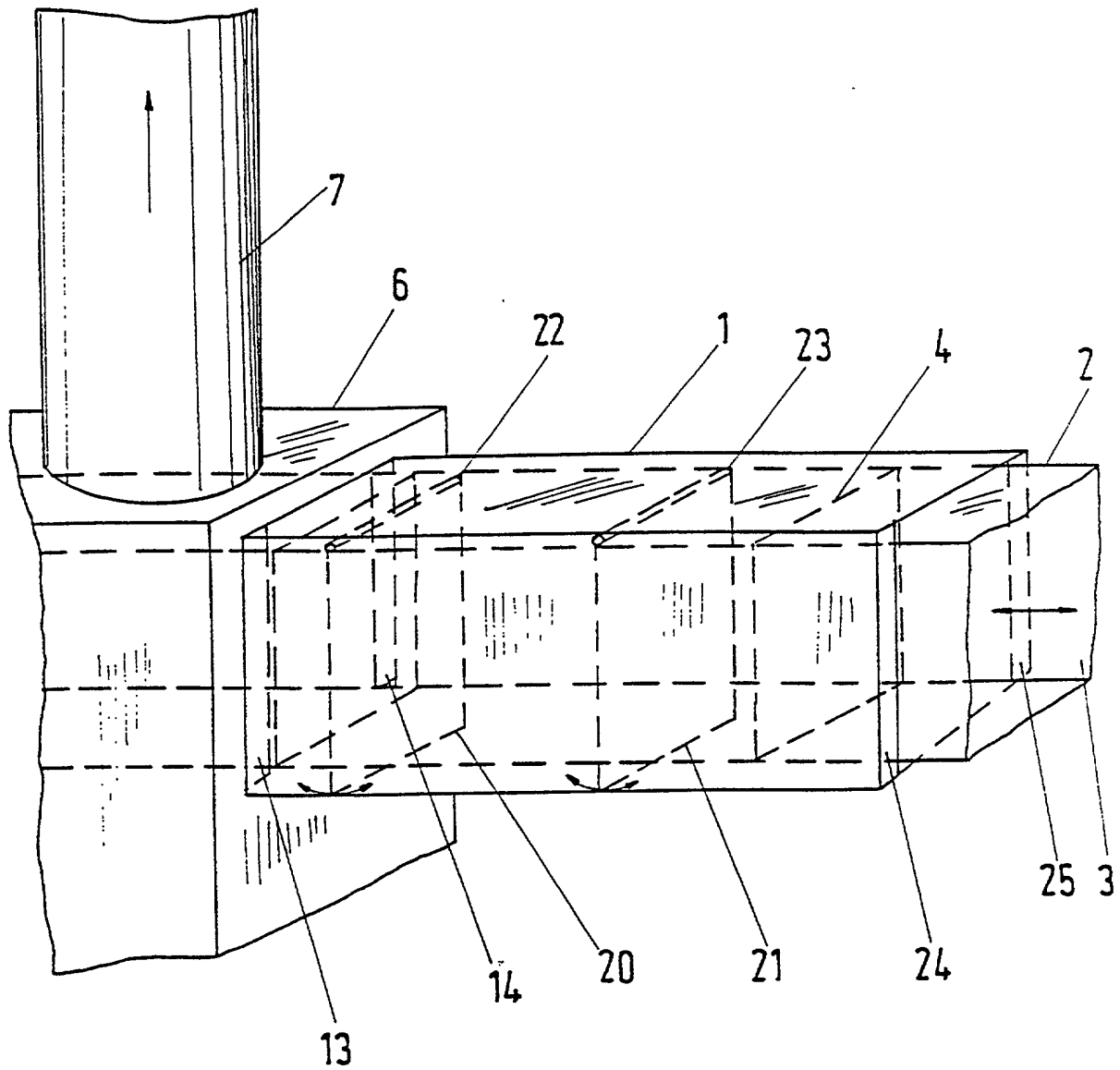


Fig.3

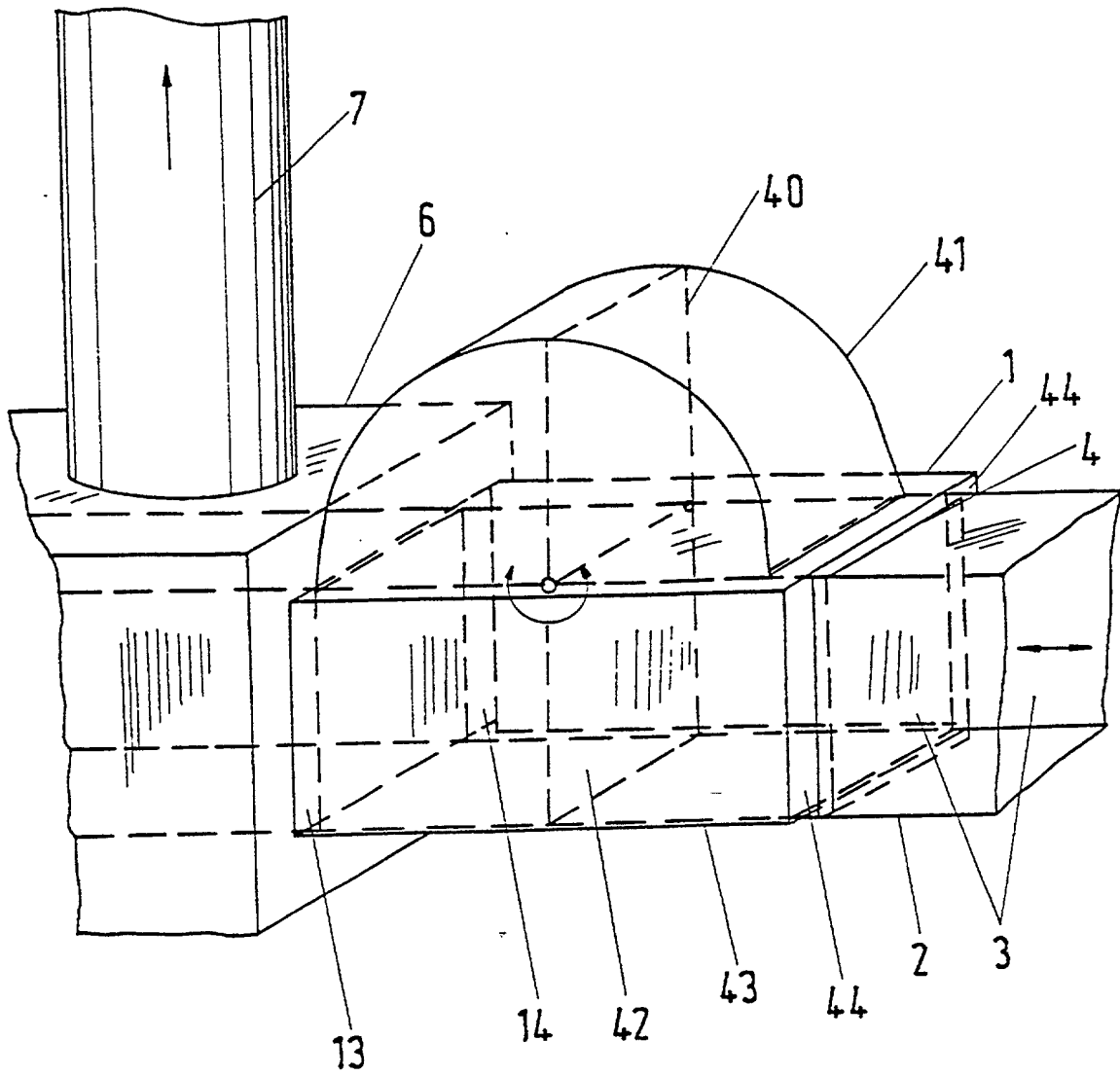


Fig.4

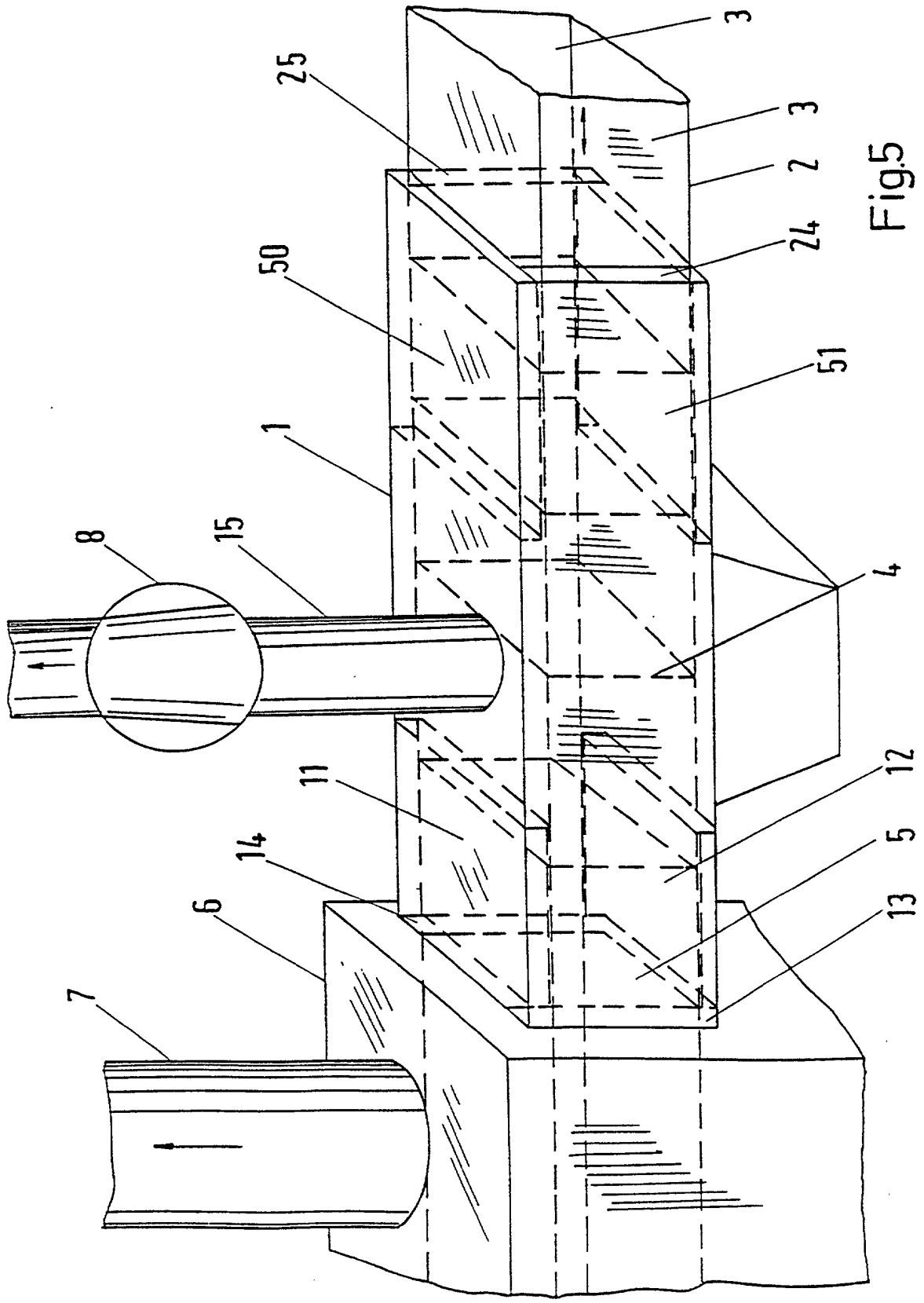


Fig. 5

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DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION/CONTINUATION-IN-PART PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated beneath my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

DEVICE AND METHOD FOR SEALING LEVELLING
DOOR APERTURE OF A COKE OVEN CHAMBER

the specification of which

 X is attached hereto.

 was filed on as Application Serial No.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability of this application in accordance with Title 37, Code of Federal Regulations. §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below, and I have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

DE 197 29 032.9 (German), filed July 8, 1997 ✓

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below, and, insofar as the subject matter of each of the claims of this application/continuation-in-part application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112. I acknowledge the duty to disclose information material to patentability as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

| | | |
|-----------------------------|-----------------------------|-----------------------------|
| PCT/EP98/04157 ✓ | July 6, 1998 ✓ | Pending |
| Application Serial No. | Filing Date | Status |
| <u> </u> | <u> </u> | <u> </u> |
| Application Serial No. | Filing Date | Status |

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I hereby appoint the firm of Vickers, Daniels & Young, Robert V. Vickers (Reg. No. 19,504), E. Kent Daniels, Jr. (Reg. No. 19,598), and Thomas E. Young (Reg. No. 28,924), Twentieth Floor, Terminal Tower, Cleveland, Ohio 44113-2235, to act jointly or severally as my attorneys, each with full power of substitution and revocation, to prosecute said application and to transact all business in the Patent and Trademark Office connected therewith.

And I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Dated this 30. day of Dec. , 199 9

Dated this 30. day of Dec. , 199 9